Wobbulator

A frequency-modulated oscillator is usually called a sweep generator today, but in 1935, it was called a wobbulator.

The first wobbulators used a motor-driven variable capacitor to sweep (or wobble) through the desired frequency range. Later circuits used a Phantastron oscillator that worked well, but still had no good way to add **markers**.

http://www.pavekmuseum.org/Wobbulator.html

Say, Wobbu-what? Yes, folks, that's the real name. This instrument looks a lot like an old oscilloscope—which it is, in fact—but it also combines a type of sweep generator known as a wobbulator.

I saw this item at a local shop, very dirty and forlorn. I was intrigued by the odd name and the reasonable pricetag, but passed it by. A couple of days later, Curt Schreiber posted a restoration question about the very same device in the rec.antiques.radio+phono newsgroup. Here is Curt's description of this device:

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A wobbulator is basically a sweep generator so that
I.F. transformers can be "flat-topped" rather than peaked.
This alignment technique was called for with the "high
fidelity" sets that sported broad-band I.F. strips. (Whether
this provided for a better listening experience might be a
topic for debate.) A plain wobbulator is a device that
would be hooked up to a scope in conjunction with an R.F.
(really an I.F.) signal generator. The Oscillograph-Wobbulator
is a scope with a built in wobbulator.
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Armed with a little more knowledge, I revisited the shop and decided to take a chance on it. The 'scope was loose in its case and terribly dirty, but all of the knobs were present and it showed no obvious signs of abuse.

The next photo shows the front of the oscillograph-wobbulator after I cleaned it up.

Again cribbing from Curt Schreiber's message, here is his description of the tube lineup and controls.

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Picture tube is a 3AP1 (I presume electrostatic deflection?)
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Other tubes: 1V, 6K8, 884, 6SJ7 (2 of them), 6J5, and 6X5.
The power transformer has 115VAC primary, and an 800V CT
secondary (also filament voltages).

There are 4 controls around the screen: Vertical Beam, Horizontal
Beam, Intensity, and Focus. On the left side of the lower panel
are three contacts (R.F. In, Vert., and Ground) and three controls
(Vert. Gain, Locking, and Sweep Vernier).

On the right side of the lower panel are three contacts (R.F. Out,
Hor., and Ground) and three controls (Hor. Gain, Band Width,
and Sweep Frequency). At the very bottom there is a jack for
Ext. Sync.

The Vertical Gain control is calibrated with "Direct" and then
"0-10". The Horizontal Gain control has the same calibrations.
The Locking control has a switch that locks in at 60 cycles. After
the switch is turned it is then a variable control calibrated "0-10".

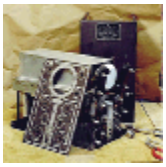
The Band Width control has a switch with "R.F. Off" and then K.C.
calibrated "0-50". The Sweep Vernier control is calibrated "0-10".
The Sweep Frequency control is a 6 position switch "Off, 7-70,
60-600, 500-5000, 3M-30M, and R.F."

Restoration Notes

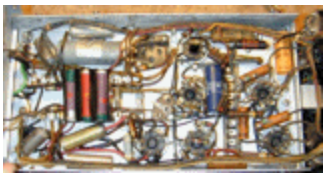
I have gotten pretty confident about my ability to restore old radios, but restoring old test equipment is a different proposition. The ills that afflict old radios—leaky capacitors, bad tubes, and so on—are often shared by test instruments. However, fixing a test device may introduce a chicken-and-egg problem. How do you calibrate the calibrator? An incorrectly-calibrated measurement instrument is useless.

I don't have any special expertise in fixing test gear, but this device piqued my curiosity, and I had very little invested in it. I decided to crack it open and see what happened.

The first step, as always, was to clean up the device and shoot some contact cleaner into its controls. The next photo shows the oscillograph-wobbulator on my workbench, partially disassembled.



Internally, the device showed good build quality. Everything was nicely laid out and the construction was robust. That's consistent with this unit's military role. Riveted to the top of the case is a metal plate stating that it was manufactured for the Navy under a contract dated November, 1943. This instrument had been serviced, perhaps more than once. Inside the chassis, I saw about some replacement capacitors. Here's a view of part of the chassis.



After spiffing things up, I put the device back into its case and cautiously powered it up on my variac. I also connected the audio output from a small radio to its vertical and horizontal inputs, to see whether it would display anything.

To my delight, it started up without any problems and seemed to work just fine, with a bright green trace. Here's the scope displaying a simple sine wave.

That's as far as I had gotten by June, 1999. As in every restoration, even if the device nominally works, I would normally go on to replace all of the paper capacitors and the filter capacitors in the power supply.

A few years later, the Triumph still sat on a shelf and I was contacted by a group who were restoring a World War II Navy vessel to become a museum. They were interested in the Triumph to help outfit the electronics shack. I sold it to them, and now my little 830 is not only operational but back in the Navy where it started out.

http://antiqueradio.org/trium01.htm

A wobulator is an electronic device primarily used for the alignment of receiver or transmitter intermediate frequency strips. It is usually used in conjunction with an oscilloscope, to enable a visual representation of a receivers passband to be seen, hence, simplifying alignment. The term "wobulator" is a portmanteau of wobble and oscillator.

The term "wobulator" without capitalization is a generic term for the swept-output RF oscillator described above, also called a "sweep generator" by most professional electronics engineers and technicians. When capitalized "Wobulator" refers to the trade name of a specific brand of RF/IF alignment generator. The Wobulator was apparently made by a company known as "TIC" although some units branded Allen B. Du Mont Laboratories" and "Stromberg-Carlson" are rumored to exist. These were apparently made under some form of license and branded with the name of the licensee, much as Radio Corporation of America through subsidiary Hazeltine Corp., licensed its KCS-20A television chassis design used in models 630TS, 8TS30, etc. to other television manufacturers Air King, Crosley, Fada, et al. for production under their brand names. The Wobulator generator, designated model 1200A, combined both sweep and marker functions into a single, self-contained, pushbutton-controlled device which, when connected to

an oscilloscope and television receiver under test, would display a representation of the receiver's RF/IF response curves with "markers" defining critical frequency reference points as a response curve on the oscilloscope screen. Such an amplitude-versus-frequency graph is also often referred to as a Bode pronounced "bodee" plot or Bode graph. A wobulator was used in some old microwave signal generators to create what amounted to frequency modulation. It physically altered the size ot the klystron cavity, therefore, changing the frequency.

http://www.museumstuff.com/learn/topics/Wobulator